2.17615

GEOPHYSICAL REPORT
FOR
OUTOKUMPU MINES LIMITED
ON THE
BANNOCKBURN PROPERTY
BANNOCKBURN AND MONTROSE TOWNSHIPS
LARDER LAKE MINING DIVISION
NORTHEASTERN, ONTARIO

Prepared by: J.C.Grant, CET, FGAC
July, 1997.

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INTRODUCTION

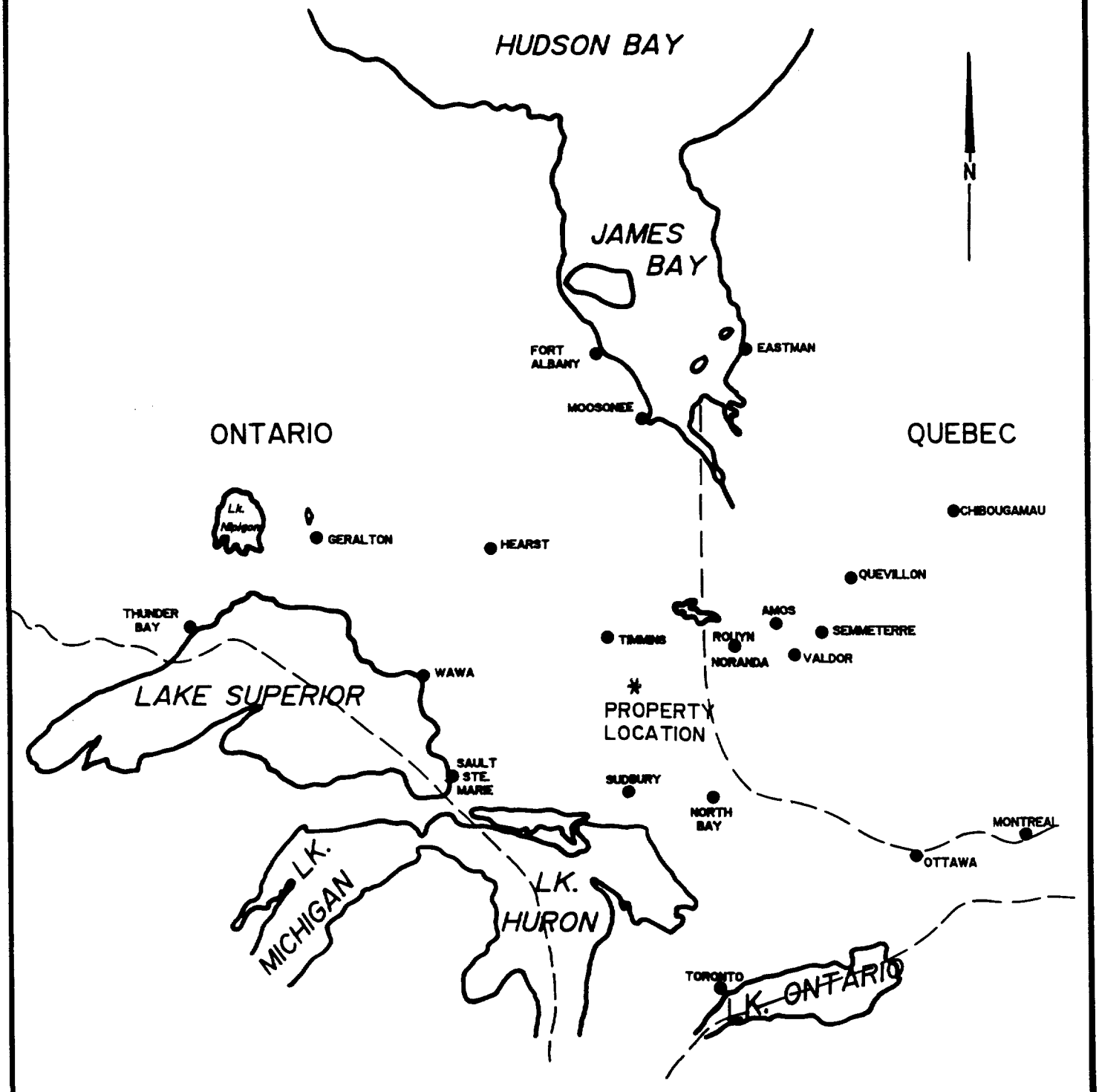
The services of Exsics Exploration Limited were retained by Outokumpu Mines Limited to complete a linecutting and geophysical program on a group of their claims located in Bannockburn and Montrose Townships of the Larder Lake Mining Division of Northeastern, Ontario.

The purpose of this program was to test the property's potential for favourable geological structure which would be suitable horizons for base metal deposition. The program commenced on the 9th of May with the beginning of the linecutting phase and was completed on the 7th of June, 1997. A total of 49.78 kilometers of grid lines were cut and surveyed on the property. This report will deal with the results of this recent ground program.

PROPERTY LOCATION AND ACCESS

The Bannockburn property is located in the west central section of Bannockburn Township and the east central section of Montrose Township of the Larder Lake Mining Division of Northeastern, Ontario. Figure 1. More specifically it is situated between Bannockburn and Charlewood Lakes, to the south, Zurbigg Lake to the east and Rahn Lake covers a portion of the north central section of the grid. The entire property is located approximately 16 kilometers northwest of the Town of Matchewan which in turn is serviced by highway 66. This highway travels southwest off of Highway 11 south which services the Town of Kirkland Lake. Figure 2.

Access to the grid during the survey period was ideal. A local outfitter maintains a good gravel road from highway 566 which leads northwest from Matachewan to a cabin located on the claim group. This cabin was used by both the linecutting crew and the survey crew. This gravel road continues from the cabin and crosses the grid in a north-south direction.



EXSICS EXPLORATION LTD.
P.O. Box 1088, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151

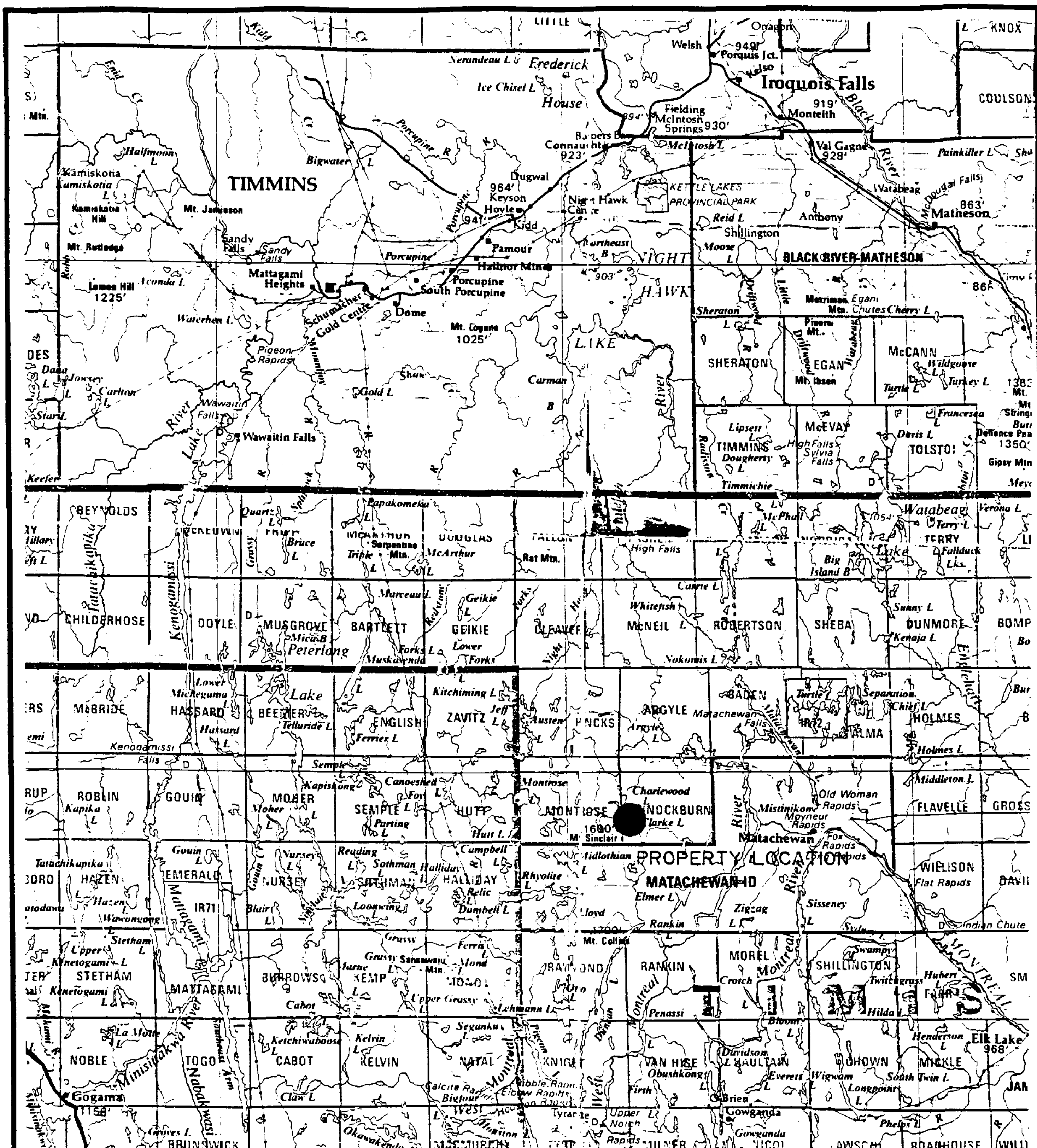
CLIENT: OUTOKUMPU MINES LTD.

PROPERTY: BANNOCKBURN PROPERTY

TITLE: BANNOCKBURN TWP.
LOCATION MAP

Fig. 1

Date: June 1997	Scale: 1"=125miles	MNDM Plan#:
Drawn: P. Gauthier	Interp: J.C. Grant	Job No. E-257



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EXSICS EXPLORATION LTD.

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Suite 13, Hollinger Bldg. Timmins Ont.
Telephone: 705-267-4151

CLIENT: OUTOKUMPU MINES LTD.

PROPERTY: BANNOCKBURN PROPERTY

TITLE: BANNOCKBURN TWP.

PROPERTY LOCATION

Fig. 2

Date: June 1997	**Scale:** 1:600,000	**MNDM Plan#:** 22-6
Drawn:	**Interp:** J.C. Grant	Job No. E-257

CLAIM GROUP

The claim numbers which form the Bannockburn property are as follows:

L-1218727	7 units
L-1218725	7 unit
L-1218721	11 units
L-1218723	1 unit
L-1218724	1 unit
L-1218736	1 unit
L-1218720	1 unit
L-1218728	1 unit
L-1218722	6 units
L-1218730	1 unit
L-1218731	1 unit
L-1218729	2 units
L-1207453	1 unit
L-1189913	1 unit
L-1218732	11 units
L-1198912	4 units

Refer to figure 3, copied from the MNDM Plan Maps of Bannockburn and Montrose townships.

PERSONNEL

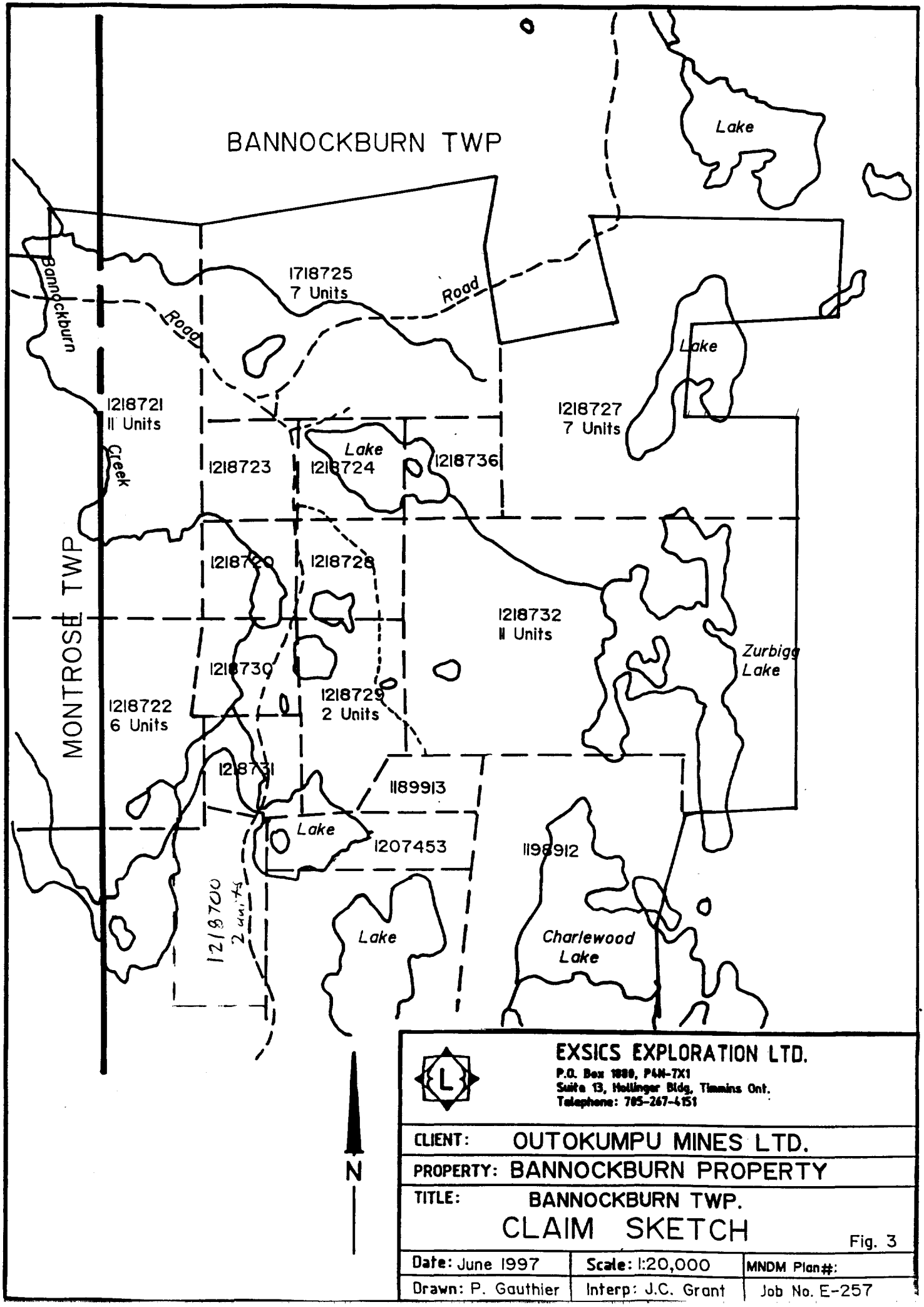
The field crew directly responsible for the collection of all raw data were as follows:

Eric Jaakkola	Timmins, Ontario
John DerWeduwen	South Porcupine, Ontario

The work was completed under the direct supervision of J.C. Grant and all of the plotting and computor compilation was completed by P. Gauthier of Exsics Exploration Limited.

GROUND PROGRAM

The ground program was completed in two phases. The first phase of the program was to cut a detailed metric grid across the property. This was done by establishing a series of tielines across the claim group which were cut an azimuth of 160 degrees and at a spacing of 500 meters. Cross lines were then turned off of these tielines, where possible, at 100 meter intervals from line 10800MN to 13200MN and cut from TL 6000ME to TL 8000ME. The tielines were necessary to control the accuracy of the cross lines. All of the cut lines were chained with 20 meter pickets.


BANNOCKBURN TWP
Lake
Bannockburn
Road
1718725
7 Units
Road
Lake
1218727
7 Units
1218721
11 Units
Creek
1218723
Lake
1218724
1218736
MONTROSE TWP
1218720
1218728
1218732
11 Units
Zurbigg
Lake
1218730
1218729
2 Units
1218722
6 Units
1218731
1189913
Lake
1207453
1198912
1218700
2 units
Lake
Charlewood
Lake
N
EXSICS EXPLORATION LTD.
P.O. Box 1888, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151
CLIENT: OUTOKUMPU MINES LTD.
PROPERTY: BANNOCKBURN PROPERTY
TITLE: BANNOCKBURN TWP.
CLAIM SKETCH
Fig. 3
Date: June 1997
Scale: 1:20,000
MNDM Plan#:
Drawn: P. Gauthier
Interp: J.C. Grant
Job No. E-257

Phase two of the program was to complete a Total Field Magnetic survey as well as a Horizontal Loop, Electromagnetic, HLEM, survey across the cut lines. The Magnetic survey was completed using the BRGM, OMNI IV Baes station system and the Scintrex Envi Mag field system. Specifications for these systems can be found as Appendix A of this report. The HLEM survey was completed using the Apex Parametrics, MaxMin II system. Specifications for this system can be found as Appendix B of this report.

The following parameters were kept constant for each survey method throughout the survey period.

Magnetic Survey:

Line spacing	100 meters
Station spacing	20 meters
Reading interval	10 meters
Diurnal monitoring	base station recorder
Record interval	30 seconds
Reference field	57400 gammas
Datum subtract	57500 gammas
Unit accuract	+/- 0.1 gammas
Parameters measured	Earth's total magnetic field

The collected, corrected and levelled magnetic data was then plotted diectly onto a base map at a scale of 1:5000 and then contoured at 50 gamma intervals where possible. A copy of this contoured base map is included in the back pocket of this report.

HLEM Survey:

Line spacing	100 meters
Station interval	20 meters
Reading interval	20 meters
Coil seperation	120 meters
Theoretical search depth	60-70 meters
Frequencies recorded	3555hz,1777hz,222hz
Parameters measured	inphase and quadrature components of the secondary field
Unit accuracy	+/- 0.5 percent

The collected data was then plotted onto a base map, one base map for each frequency, and then profiled at 1cm to +/- 20 percent. An interpretation for all of the conductive zones has been placed on these base maps were possible. The interpretation consists of the depth to source and the approximate conductivity of the zone. A copy of each of these maps is also included in the back pocket of this report.

SURVEY RESULTS

The surveys were successful in locating and outlining several conductive zones across the grid. Each of the zones will be discussed seperately and in detail below.

ZONE A:

This zone strikes north-northwest across lines 11700MN to and including 12800MN, just to the east of the 6500ME tieline. The zone represents a moderate to weak conductor with a conductivity value of 2.5 mhos and situated at a depth of about 40 meters. The entire strike of the zone lies along the west flank of a strong magnetic unit which most likely represents one of the north-northwest trending basaltic flows.

ZONE B:

This zone also strikes north-northwest across lines 12600MN to 13200Mn and continues off of the grid to the north. It also represents a weak zone of 2 mhos at a depth of 35 meters. Again, the zone appears to lie along the edge of one of the basaltic flows.

ZONE C:

This zone closely parallels the strike of zone B and represents a moderate conductor with a conductivity of 2.5 to 5 mhos situated at a depth of 25 meters. The zone relates to a good magnetic high unit which appears to have been truncated to the north by an east-northeast cross structure respresented by the shape of the small lake in the vicinity. The cross structure can be followed in the magnetic contours as well.

ZONE D:

This zone also follows the structural trends of the property. It strikes north-northwest across lines 11600MN to 12100MN where it appears to merge with conductive zone A. The zone represents a moderate to weak conductor of 3 mhos situated at a depth of 25 meters. Again, it seems to relate to a basaltic flow unit.

ZONE E:

This zone represents a weak zone striking across lines 12500MN to 12700MN. The zone lies within an area of high magnetic relief suggesting it may relate to basalts intermixed with iron rich materials. The zone has a conductivity of 3 mhos and is situated at a depth of 44 meters.

ZONE F:

This zone may infact be the northwest extension of zone E. It lies along the flank of a good magnetic unit most probably relating to the intrusives striking throughout the grid. This zone appears to continue off of the grid to the northwest.

The magnetic survey outlined an area of activity situated between the 6500ME and 7500ME tielines. The magnetic high units probably relate to ultramafic flows comprised of basalts and or varying amount of iron rich materials. The generaly strike of the underlaying geology is north-northwest with several east-northeast cross structures. The magnetic signature of the intrusives is about 3500 to 5000 gammas above the background.

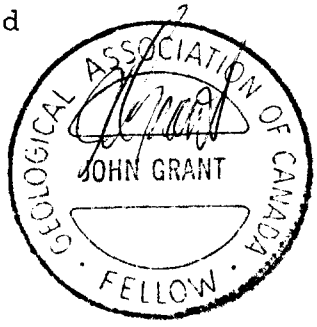
CONCLUSIONS AND RECOMMENDATIONS:

The conductive zones outlined by the present survey are all relatively moderate to weak zones at moderately shallow depths. Historically, past gold mineralization occured in numerous quartz veins, the two main ones being the Ashley and Garvey Veins,(Gold Deposits of Ontario, Part 2, p.125, Ashley Mine, Past Producer. references: ODM 1932, Vol.41, pt. 2, p.13-18). The Ashley Vein consisted of connected lenses of Quartz cutting the basalts. It strikes north 10 degrees west and dips 50 degrees west. The Garvey Vein strikes east and dips 20 degrees to the north.

The magnetic contours of the grid indicate that there are a number of these northwest striking units which should be examined closer. This should be done by geological and geochemical surveys. There are also several of the more subtle east-northeast striking units which should also be followed up further by the same surveys.

Should encouraging results be found along any of the conductive zones and or the magnetic units, then a drilling program should be considered to test the zones at depth.

Respectfully submitted



J.C.Grant, CET, FGAC
July, 1997

CERTIFICATE

I, John C. Grant, hereby certify that:

1) I am a graduate technologist, (1975) of the three year program in Geological Technology at Cambrian College of Applied Arts and Technology, Sudbury Campus. I have worked subsequently as an Exploration Geophysicist for Teck Exploration Limited, (5 years), North Bay office and currently as Exploration Manager and Geophysicist for Exsics Exploration Limited since 1980.

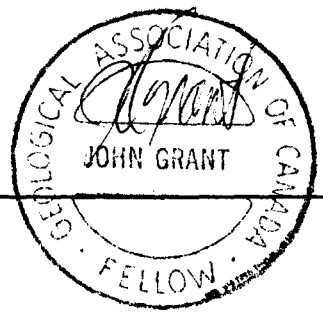
2) I am a member in good standing of the Certified Engineering Technologist Association,(CET), since 1984

3) I am a Fellow of the Geological Association of Canada, (FGAC), since 1986.

4) I have been actively engaged in my profession since May of 1975, including all aspects of exploration studies, surveys and interpretation.

5) I have no specific or special interest in the described property. I have been retained as a Consulting Geophysicist by the Property holders.

John Charles Grant, CET, FGAC.



APPENDIX A

OMNI IV
"Tie-Line" Magnetometer

Four Magnetometers in One

Self Correcting for Diurnal Variations

Reduced Instrumentation Requirements

25% Weight Reduction

User Friendly Keypad Operation

Universal Computer Interface

Comprehensive Software Packages

Specifications

ynamic Range	18,000 to 110,000 gammas. Roll-over display feature suppresses first significant digit upon exceeding 100,000 gammas.
Tuning Method	Tuning value is calculated accurately utilizing a specially developed tuning algorithm
utomatic Fine Tuning	± 15% relative to ambient field strength of last stored value
Display Resolution	0.1 gamma
ocessing Sensitivity	± 0.02 gamma
atistical Error Resolution	0.01 gamma
Absolute Accuracy	± 1 gamma at 50,000 gammas at 23°C ± 2 gamma over total temperature range
andard Memory Capacity	
Total Field or Gradient	1,200 data blocks or sets of readings
Tie-Line Points	100 data blocks or sets of readings
Base Station	5,000 data blocks or sets of readings
splay	Custom-designed, ruggedized liquid crystal display with an operating temperature range from −40°C to +55°C. The display contains six numeric digits, decimal point, battery status monitor, signal decay rate and signal amplitude monitor and function descriptors.
232 Serial I/O Interface	2400 baud, 8 data bits, 2 stop bits, no parity
Gradient Tolerance	6,000 gammas per meter (field proven)
st Mode	A. Diagnostic testing (data and programmable memory) B. Self Test (hardware)
Sensor	Optimized miniature design. Magnetic cleanliness is consistent with the specified absolute accuracy.
adient Sensors	0.5 meter sensor separation (standard), normalized to gammas/meter. Optional 1.0 meter sensor separation available. Horizontal sensors optional.
Sensor Cable	Remains flexible in temperature range specified, includes strain-relief connector
cling Time (Base Station Mode)	Programmable from 5 seconds up to 60 minutes in 1 second increments
Operating Environmental Range	−40°C to +55°C; 0–100% relative humidity; weatherproof
wer Supply	Non-magnetic rechargeable sealed lead-acid battery cartridge or belt; rechargeable NiCad or Disposable battery cartridge or belt; or 12V DC power source option for base station operation.
ttery Cartridge/Belt Life	2,000 to 5,000 readings, for sealed lead acid power supply, depending upon ambient temperature and rate of readings
Weights and Dimensions	
nstrument Console Only	2.8 kg, 238 x 150 x 250mm
NiCad or Alkaline Battery Cartridge	1.2 kg, 235 x 105 x 90mm
NiCad or Alkaline Battery Belt	1.2 kg, 540 x 100 x 40mm
Lead-Acid Battery Cartridge	1.8 kg, 235 x 105 x 90mm
Lead-Acid Battery Belt	1.8 kg, 540 x 100 x 40mm
Sensor	1.2 kg, 56mm diameter x 200mm
Gradient Sensor (0.5 m separation - standard)	2.1 kg, 56mm diameter x 790mm
Gradient Sensor (1.0 m separation - optional)	2.2 kg, 56mm diameter x 1300mm
Standard System Complement	Instrument console; sensor; 3-meter cable, aluminum sectional sensor staff, power supply, harness assembly, operations manual.
Base Station Option	Standard system plus 30 meter cable
Gradiometer Option	Standard system plus 0.5 meter sensor

E D A Instruments Inc.
4 Thorncliffe Park Drive
Toronto, Ontario
Canada M4H 1H1
Telex: 06 23222 EDA TOR
Cable: Instruments Toronto
(416) 425 7800

In U.S.A.
E D A Instruments Inc.
5151 Ward Road
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422 9112

Printed in Canada

SCINTREX

ENVI-MAG Environmental Magnetometer/Gradiometer

Locating Buried Drums and Tanks?

The ENVI-MAG is the solution to this environmental problem. ENVI-MAG is an inexpensive, lightweight, portable "WALKMAG" which enables you to survey large areas quickly and accurately.

ENVI-MAG is a portable, proton precession magnetometer and/or gradiometer, for geotechnical, archaeological and environmental applications where high production, fast count rate and high sensitivity are required. It may also be used for other applications, such as mineral exploration, and may be configured as a total-field magnetometer, a vertical gradiometer or as a base station.

The ENVI-MAG

- easily detects buried drums to depths of 10 feet or more
- more sensitive to the steel of a buried drum than EM or radar
- much less expensive than EM or radar
- survey productivity much higher than with EM or radar

Main features include:

- select sampling rates as fast as 2 times per second
- "WALKMAG" mode for rapid acquisition of data
- large internal, expandable memory
- easy to read, large LCD screen displays data both numerically and graphically
- ENVIMAP software for processing and mapping data

ENVI-MAG comprises several basic modules; a lightweight console with a large screen alphanumeric display and high capacity memory, a staff mounted sensor and sensor cable, rechargeable battery and battery charger, RS-232 cable and ENVIMAP processing and mapping software.

For gradiometry applications an upgrade kit is available, comprising an additional processor module for installation in the console, and a second sensor with a staff extender.

ENVI-MAG Proton Magnetometer in operation

For base station applications a Base Station Accessory Kit is available so that the sensor and staff may be converted into a base station sensor.

Features and Benefits

"WALKMAG" Magnetometer/Gradiometer

The "WALKMAG" mode of operation (sometimes known as "Walking Mag") is user-selectable from the keyboard. In this mode, data is acquired and recorded at the rate of 2 readings per second as the operator walks at a steady pace along a line. At desired intervals, the operator "triggers" an event marker by a single key stroke, assigning coordinates to the recorded data.

True Simultaneous Gradiometer

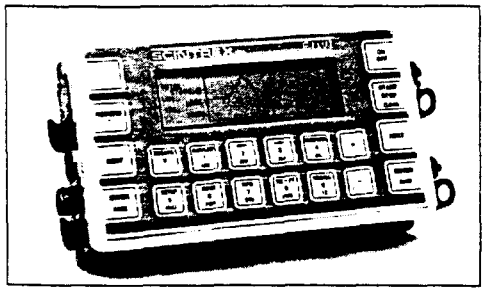
An optional upgrade kit is available to configure ENVI-MAG as a gradiometer to make true, simultaneous gradiometer measurements. Gradiometry is useful for geotechnical and archaeological surveys where small near surface magnetic targets are the object of the survey.

Selectable Sampling Rates

0.5 second, 1 second and 2 second reading rates user selectable from the keyboard.

Large-Key Keypad

The large-key keypad allows easy access for gloved-hands in cold-weather operations. Each key has a multi-purpose function.



Front panel of ENVI-MAG showing a graphic profile of data and large-key keypad

Large Capacity Memory

ENVI-MAG with standard memory stores up to 28,000 readings of total field measurements, 21,000 readings of gradiometry data or 151,000 readings as a base station. An expanded memory option is available which increases this standard capacity by a factor of 5.

Easy Review of Data

For quality of data and for a rapid analysis of the magnetic characteristics of the survey line, several modes of review are possible. These include the measurements at the last four stations, the ability to scroll through any or all previous readings in memory, and a graphic display of the previous data as profiles, line by line. This feature is very useful for environmental and archaeological surveys.

Highly Productive

The "WALKMAG" mode of operation acquires data rapidly at close station intervals, ensuring high-definition results. This increases survey productivity by a factor of 5 when compared to a conventional magnetometer survey.

"Datacheck" Quality Control of Data

"Datacheck" provides a feature wherein at the end of each survey line, data may be reviewed as a profile on ENVI-MAG's screen. Datacheck confirms that the instrument is functioning correctly and

allows the user to note the magnetic relief (anomaly) on the line.

Large Screen Display

"Super-Twist" 64 x 240 dot (8 lines x 40 characters), LCD graphic screen provides good visibility in all light conditions. A display heater is optionally available for low-temperature operations below 0°C.

Close-up of the ENVI-MAG screen showing data presented after each reading

Interactive Menus

The set-up of ENVI-MAG is menu-driven, and minimizes the operator's learning time, and on-going tasks.

Close-up of display of ENVI-MAG showing interactive set-up menu

Rechargeable Battery and Battery Charger

An "off-the-shelf" lead-acid battery and charger are provided as standard. The low-cost "Camcorder" type battery is available from electronic parts distributors everywhere.

HELP-Line Available

Purchasers of ENVI-MAG are provided with a HELP-Line telephone number to call in the event assistance is needed with an application or instrumentation problem.

ENVIMAP Processing and Mapping Software

Supplied with ENVI-MAG, and custom designed for this purpose, is easy-to-use, very user-friendly, menu driven data processing and mapping software called ENVIMAP. This unique software appears to the user to be a single program, but is in fact a sequence of separate programs, each performing a specific task. Under the menu system, there are separate programs to do the following:

a) read the ENVI-MAG data and reformat it into a standard compatible with the ENVIMAP software
b) grid the data into a standard grid format
c) create a vector file of posted values with line and baseline identification that allows the user to add some title information and build a suitable surround
d) contour the gridded data
e) autoscale the combined results of the posting/surround step and the contouring step to fit on a standard 8.5 ins. wide dot-matrix printer
f) rasterize and output the results of step e) to the printer

ENVIMAP is designed to be as simple as possible. The user is required to answer a few basic questions asked by ENVIMAP, and then simply toggles "GO" to let ENVIMAP provide default parameters for the making of the contour map. The user can modify certain characteristics of the output plot. ENVIMAP'S menu system is both keyboard and mouse operable. HELP screens are integrated with the menu system so that HELP is displayed whenever the user requests it.

Options Available

- True simultaneous gradiometer upgrade
- Base station upgrade
- Display heater for low temperature operations
- External battery pouch

Specifications

Total Field Operating Range
20,000 to 100,000 nT (gammas)

Total Field Absolute Accuracy
+/- 1nT

Sensitivity
).1 nT at 2 second sampling rate

Tuning
Fully solid state. Manual or automatic, key-board selectable

Cycling (Reading) Rates
0.5, 1 or 2 seconds, up to 9999 seconds for base station applications, keyboard selectable

Gradiometer Option
Includes a second sensor, 20 inch (½m) staff extender and processor module

"WALKMAG" Mode
).5 second for walking surveys, variable rates for hilly terrain

Digital Display
.CD "Super Twist", 240 x 64 dots graphics, d line x 40 characters alphanumerics

Display Heater
Thermostatically controlled, for cold weather)perations

Keyboard Input
57 keys, dual function, membrane type

Notebook Function
32 characters, 5 user-defined MACRO's for)uick entry

Standard Memory
Total Field Measurements: 28,000 readings
Gradiometer Measurements: 21,000 readings
Base Station Measurements: 151,000 readings

Expanded Memory
Total Field Measurements: 140,000 readings
Gradiometer Measurements: 109,000 readings
Base Station Measurements: 750,000 readings

Real-Time Clock
Records full date, hours, minutes and seconds with 1 second resolution, +/- 1 second stability over 12 hours

Digital Data Output
RS-232C interface, 600 to 57,600 Baud, 7 or 8 data bits, 1 start, 1 stop bit, no parity format. Selectable carriage return delay (0-999 ms) to accommodate slow peripherals. Handshaking is done by X-on/X-off

Analog Output
0 - 999 mV full scale output voltage with keyboard selectable range of 1, 10, 100, 1,000 or 10,000 nT full scale

Power Supply
Rechargeable "Camcorder" type, 2.3 Ah, Lead-acid battery.

12 Volts at 0.65 Amp for magnetometer, 1.2 Amp for gradiometer,

External 12 Volt input for base station operations

Optional external battery pouch for cold weather operations

Battery Charger
110 Volt - 230 Volt, 50/60 Hz

Operating Temperature Range
Standard 0° to 60°C
Optional -40°C to 60°C

Dimensions
Console - 10 x 6 x 2.25 inches (250 mm x 152 mm x 55 mm)
T.F. sensor - 2.75 inches dia. x 7 inches (70 mm x 175 mm)
Grad. sensor and staff extender - 2.75 inches dia. x 26.5 inches (70 mm x 675 mm)
T.F. staff - 1 inch dia. x 76 inches (25 mm x 2 m)

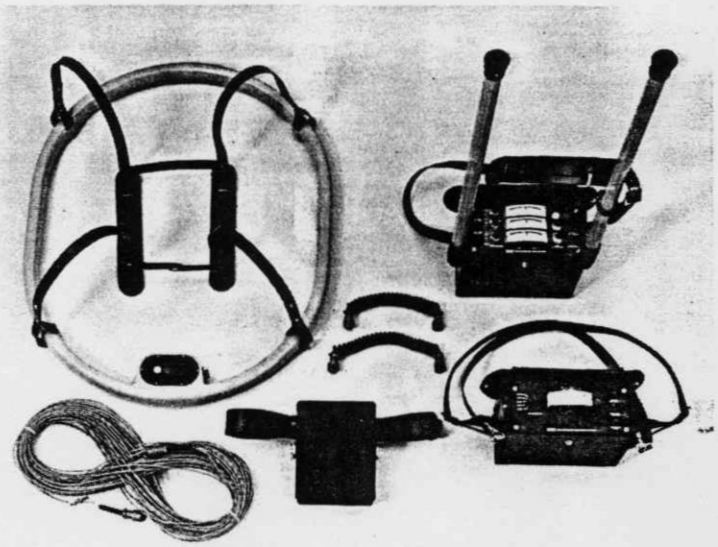
Weight
Console - 5.4 lbs (2.45 kg) with rechargeable battery
T. F. sensor - 2.2 lbs (1.15 kg)
Grad. sensor - 2.5 lbs (1.15 kg)
Staff - 1.75 lbs (0.8 kg)

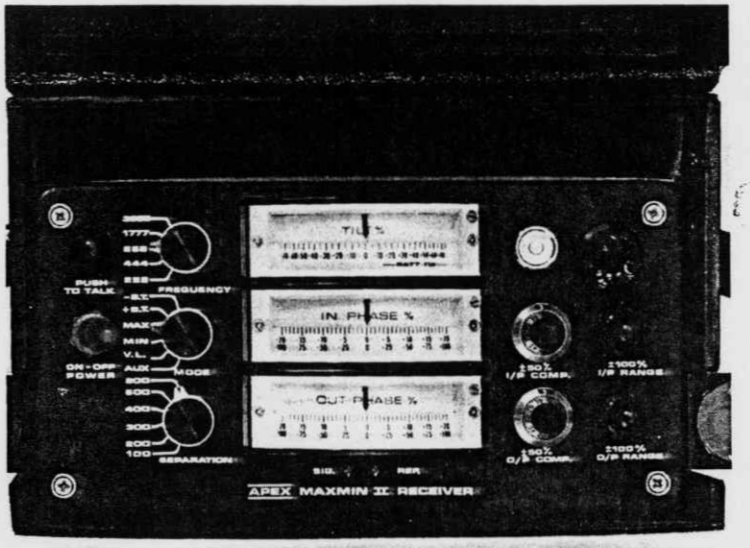
SCINTREX

Head Office
222 Snidercroft Road
Concord, Ontario, Canada L4K 1B5
Telephone: (905) 669-2280
Fax: (905) 669-6403 or 669-5132
Telex: 06-964570

In the USA:
Scintrex Inc.
85 River Rock Drive
Unit 202
Buffalo, NY 14207
Telephone: (716) 298-1219
Fax: (716) 298-1317

APPENDIX B





SPECIFICATIONS

Frequencies: 222, 444, 888, 1777 and 3555 Hz.

Modes of Operation:
- MAX: Transmitter coil plane and receiver coil plane horizontal (Max-coupled; Horizontal-loop mode). Used with reference cable.
- MIN: Transmitter coil plane horizontal and receiver coil plane vertical (Min-coupled mode). Used with reference cable.
- V.L. : Transmitter coil plane vertical and receiver coil plane horizontal (Vertical-loop mode). Used without reference cable, in parallel lines.

Coil Separations: 25, 50, 100, 150, 200 & 250m (MMII) or 100, 200, 300, 400, 600 and 800 ft. (MMIIF).
Coil separations in V.L.mode not restricted to fixed values.

Parameters Read:
- In-Phase and Quadrature components of the secondary field in MAX and MIN modes.
- Tilt-angle of the total field in V.L. mode.

Readouts:
- Automatic, direct readout on 90mm (3.5") edgewise meters in MAX and MIN modes. No nulling or compensation necessary.
- Tilt angle and null in 90mm edgewise meters in V.L.mode.

Scale Ranges:

In-Phase:	±20%, ±100% by push-button switch.
Quadrature:	±20%, ±100% by push-button switch.
Tilt:	±75% slope.
Null (V.L.):	Sensitivity adjustable by separation switch.

Readability: In-Phase and Quadrature: 0.25 % to 0.5 % ; Tilt: 1 %.

Repeatability: ±0.25% to ±1% normally, depending on conditions, frequencies and coil separation used.

Transmitter Output:
- 222Hz : 220 Atm²
- 444Hz : 200 Atm²
- 888Hz : 120 Atm²
- 1777Hz : 60 Atm²
- 3555Hz : 30 Atm²

Receiver Batteries: 9V trans. radio type batteries (4). Life: approx. 35hrs. continuous duty (alkaline, 0.5 Ah), less in cold weather.

Transmitter Batteries: 12V 6Ah Gel-type rechargeable battery. (Charger supplied).

Reference Cable: Light weight 2-conductor teflon cable for minimum friction. Unshielded. All reference cables optional at extra cost. Please specify.

Voice Link: Built-in intercom system for voice communication between receiver and transmitter operators in MAX and MIN modes, via reference cable.

Indicator Lights: Built-in signal and reference warning lights to indicate erroneous readings.

Temperature Range: -40°C to +60°C (-40°F to +140°F).

Receiver Weight: 6kg (13 lbs.)

Transmitter Weight: 13kg (29 lbs.)

Shipping Weight: Typically 60kg (135 lbs.), depending on quantities of reference cable and batteries included. Shipped in two field/shipping cases.

Specifications subject to change without notification.

APEX PARAMETRICS LIMITED
200 STEELCASE RD. E., MARKHAM, ONT., CANADA, L3R 1G2

Phone: (416) 495-1612 Cables: APEXPARA TORONTO Telex: 06-966773 NORDVIK TOR

APEX MAXMIN II PORTABLE EM

Five frequencies: 222, 444, 888, 1777 and 3555 Hz.

Maximum coupled (horizontal-loop) operation with reference cable.

Minimum coupled operation with reference cable.

Vertical-loop operation without reference cable.

Coil separations: 25, 50, 100, 150, 200 and 250 m (with cable) or 100, 200, 300, 400, 600 and 800 ft.

Reliable data from depths of up to 180 m (600 ft).

Built-in voice communication circuitry with cable.

Tilt meters to control coil orientation.

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use): W9780.00784
Assessment Files Research Imaging

Personal information collected on this form is obtained under the authority of subsections 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, the info t work and correspond with the mining land holder. Questions about t if Northern Development and Mines, 6th Floor, 933 Ramsey Lake

41P15NW0016 2.17615 BANNOCKBURN

Instructions: - Please type or print in ink. 900 m, use form 0240.

2.17615

1. Recorded holder(s) (Attach a list if necessary)

Name	Client Number
Outokumpu Mines Ltd.	178525
Address	**Telephone Number**
P.O Box 1123, Timmins, ON P4N 7H9	(705) 264-5024
	Fax Number
	(705) 264-5067
Name	**Client Number**
Address	**Telephone Number**
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☒ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling, stripping, trenching and associated assays ☐ Rehabilitation

Work Type	Office Use
Line Cutting, Surveyed Line Cutting, Magnetic Survey, HLEM Survey.	Commodity
	Total $ Value of Work Claimed 27,769
Dates Work Performed From 09 (Day) 05 (Month) 97 (Year) To 09 (Day) 06 (Month) 97 (Year)	NTS Reference
Global Positioning System Data (if available) — Township/Area: Bannockburn, Montrose Twps. — M or G-Plan Number: M-207, M-237	Mining Division K. LAKE
	Resident Geologist District K. LAKE

Please remember to:
- obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name	Telephone Number
John C. Grant, Exsizs Exploration Ltd.	(705) 267-4151
Address	**Fax Number**
P.O Box 1860, Timmins, ON P4N 7X1	(705) 264-5790
Name	**Telephone Number**
Address	**Fax Number**
Name	**Telephone Number**
Address	**Fax Number**

RECEIVED 10:00 AUG 18 1997 GEOSCIENCE ASSESSMENT OFFICE

RECEIVED AUG 18 1997 10:25

RECEIVED AUG 18 1997 4:00 PM GEOSCIENCE ASSESSMENT OFFICE

4. Certification by Recorded Holder or Agent

I, Paul Davis (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent		Date
Paul		August 12/97
Agent's Address	**Telephone Number**	**Fax Number**
P.O. Box 1123, Timmins, ON P4N 7H9	(705) 264-5024	(705) 264-5067

Deemed Nov. 16/97

	Mining Claim #	# of Claim Units	Work Performed	Work Applied	Work Assigned	Bank
1	1198911	8	950	3200	0	0
2	1198912	4	950	0	950	0
3	1198913	1	950	400	550	0
4	1207453	1	950	0	950	0
5	1218700	2	950	800	0	150
6	1218721	11	3069	4400	0	0
7	1218722	6	1900	2400	0	0
8	1218723	1	1300	400	900	0
9	1218724	1	1550	400	1150	0
10	1218725	7	3800	2800	1000	0
11	1218726	1	0	400	550	0
12	1218727	7	950	2800	0	0
13	1218728	1	950	400	550	0
14	1218729	2	1900	800	0	1100
15	1218730	1	950	400	131	419
16	1218731	1	950	400	550	0
17	1218732	11	5700	4400	0	1300
18	1218736	1	0	400	0	0
		Column Totals	27769	24800	7281	2969

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use)
W9730.00783

Personal information collected on this form is obtained under the authority of subsection 6(1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

2.17615

Work Type	Units of Work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost
Line Cutting	49.78 km	$265/km	$13,191.00
Line Cutting with Transit	3.2 km	$735/km	$2,350.00
Magnetic Geophysical Survey	49.78 km	$100/km	$4,978.00
HLEM Survey	40.00 km	$160/km	$6,400.00
Plotting	4 copies	$212.50/copy	$850.00
Associated Costs (e.g. supplies, mobilization and demobilization).			
Transportation Costs			
Food and Lodging Costs			
		Total Value of Assessment Work	$27,769.00

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

TOTAL VALUE OF ASSESSMENT WORK × 0.50 = Total $ value of worked claimed.

Note:
- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a

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10:00
AUG 18 1997
GEOSCIENCE ASSESSMENT OFFICE

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9846
Fax: (705) 670-5863

October 17, 1997

Paul Davis
OUTOKUMPU MINES LTD.
P.O. BOX 1123
TIMMINS, Ontario
P4N - 7

Dear Sir or Madam:

Submission Number: 2.17615

Subject: Transaction Number(s):		**Status**
	W9780.00784	Deemed Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Steve Beneteau by e-mail at beneteau_s@torv05.ndm.gov.on.ca or by telephone at (705) 670-5855.

Yours sincerely,

ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 11462

Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.17615

Date Correspondence Sent: October 17, 1997 **Assessor:** Steve Beneteau

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9780.00784	1198911	BANNOCKBURN, MONTROSE	Deemed Approval	October 17, 1997

Section:
14 Geophysical MAG
14 Geophysical EM

Correspondence to:
Resident Geologist
Kirkland Lake, ON

Assessment Files Library
Sudbury, ON

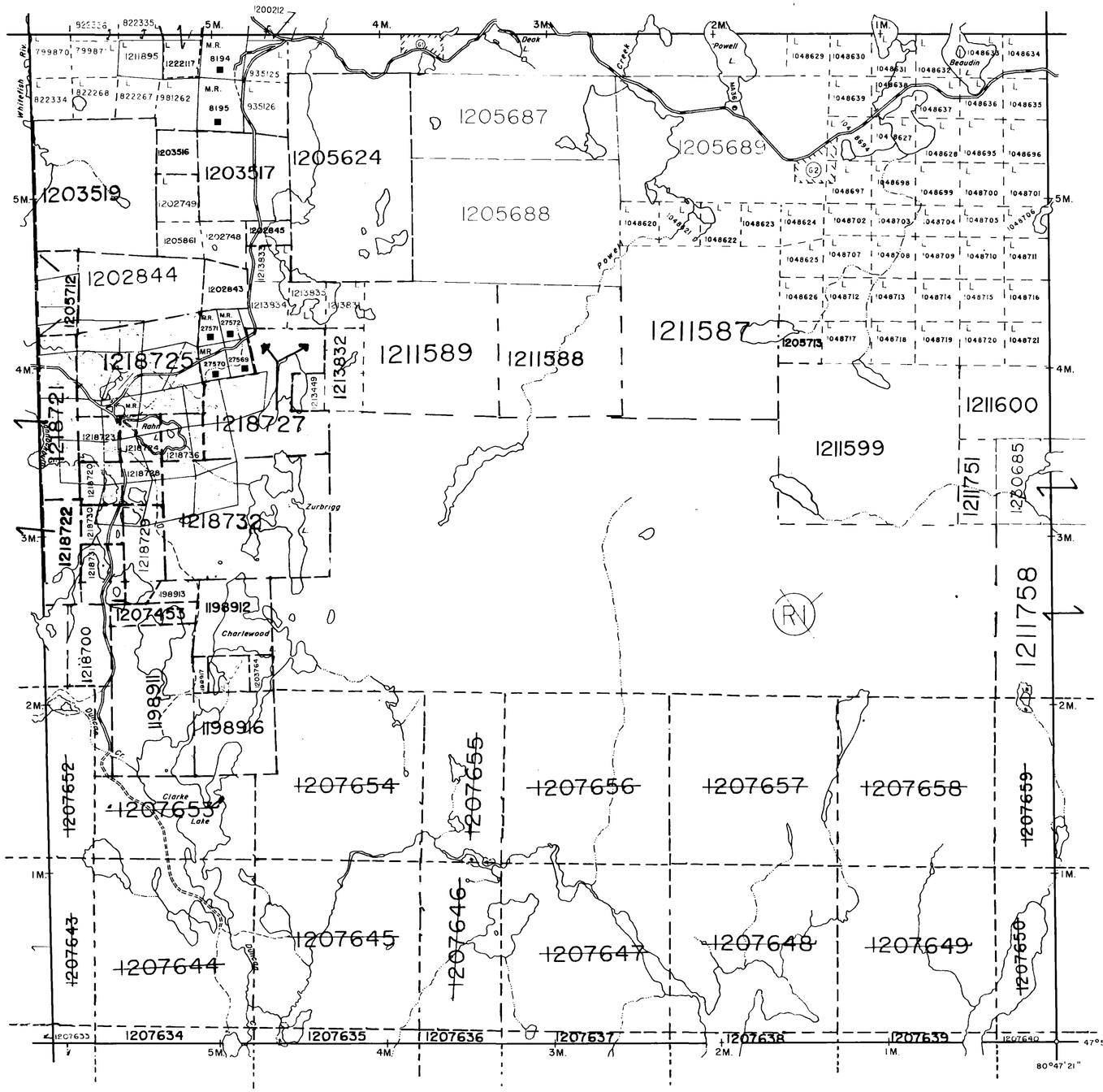
Recorded Holder(s) and/or Agent(s):
Paul Davis
OUTOKUMPU MINES LTD.
TIMMINS, Ontario

Correspondence ID: 11462

TRIM LINE

2.17615

ARGYLE TWP. - M.203



MONTROSE TWP. - M.237

POWELL TWP. - M.241

DOON TWP. - M.217

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES. AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES. FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON

2.17615
MAG, EM

THE TOWNSHIP OF

BANNOCKBURN

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

DISPOSITION OF CROWN LANDS

- PATENT, SURFACE AND MINING RIGHTS ●
- " , SURFACE RIGHTS ONLY ◓
- " , MINING RIGHTS ONLY ◒
- LEASE, SURFACE AND MINING RIGHTS ■
- " , SURFACE RIGHTS ONLY ◨
- " , MINING RIGHTS ONLY ◧
- LICENCE OF OCCUPATION ▼

- ROADS
- IMPROVED ROADS
- KING'S HIGHWAYS
- RAILWAYS
- POWER LINES
- MARSH OR MUSKEG
- MINES
- CANCELLED C.

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

SAND AND GRAVEL

(G1) M.T.C. GRAVEL PIT 3F-25

(G2) M.T.C. GRAVEL PIT 1374

(R1) ~~SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING, SECTION 36/80 ORDER NO. W 65/83~~

(R1) Mining & Surface Rights Reopened to prospecting, sale or lease. Order C-L-10/95, previously withdrawn under Order W-65/83

NOTICE OF FORESTRY ACTIVITY.

THIS TOWNSHIP / AREA FALLS WITHIN THE ELK LAKE MANAGEMENT UNIT

AND MAY BE SUBJECT TO FORESTRY OPERATIONS

THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT P.O. BOX 129 SWASTIKA, ONT. P0K 1T0 705-642-3222

PLAN NO. M.207

ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

ARCHIVED MARCH 24/97
CIRCULATED JANUARY 27, 1995

200

TOS.M BANNOCKBURN TOS.M

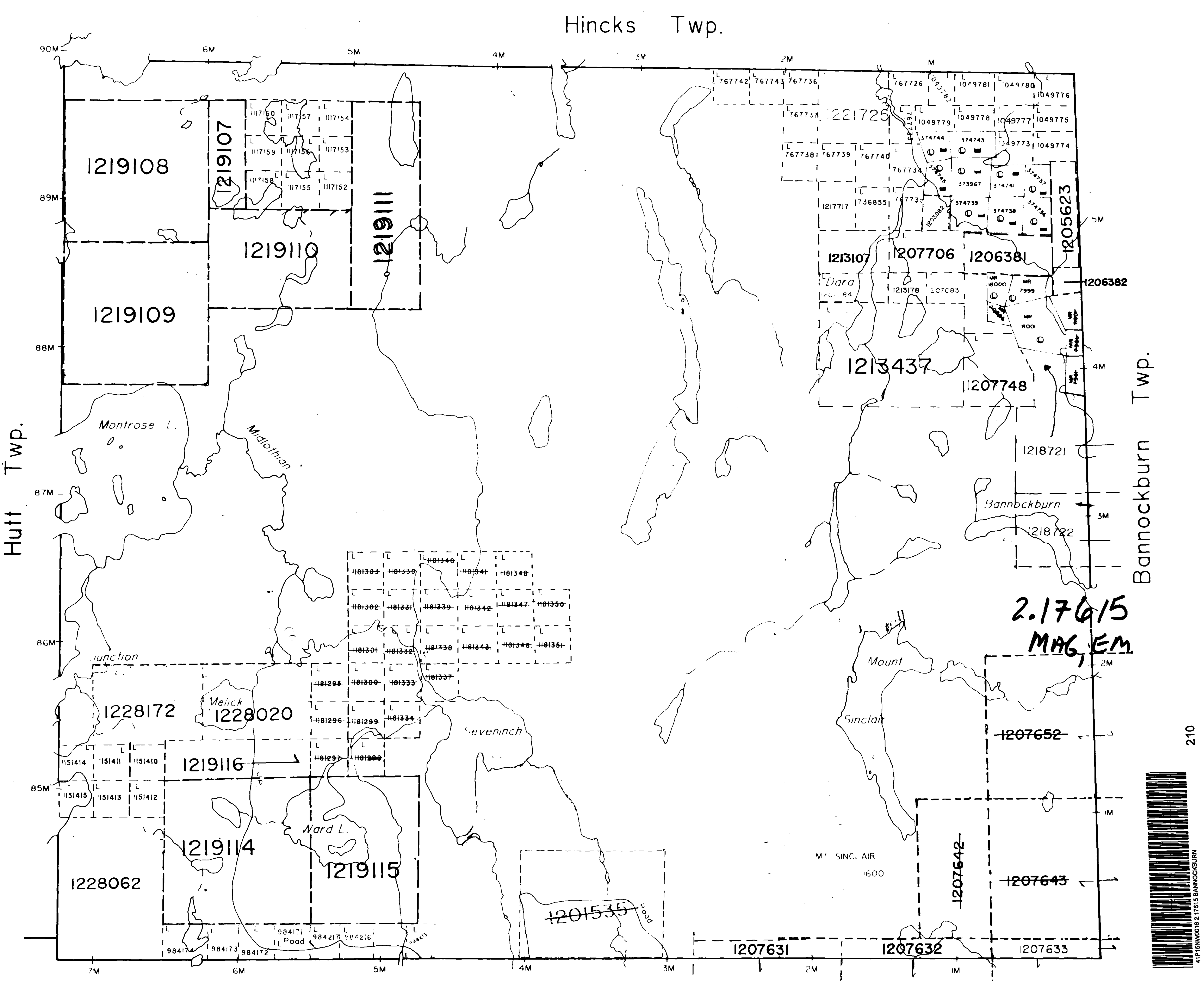
2.17615

RENCES

[illegible] FROM DISPOSITION

ights withdrawn from prospecting
ose Section 36, The Mining Act
o. NRW 65/83 Nov 18, 1983

ights Reopened to prospecting, sale or
[illegible]0795, previously withdrawn under



MATION THAT
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COMPILED
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RACY IS NOT
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WN HEREON.

RESTRY ACTIVITY

A FALLS WITHIN THE ——
NT UNIT

TO FORESTRY OPERATIONS.
TER FOR THIS AREA CAN BE
BOX 129
STIKA, ONT.
ITO
-642-3222

LEGEND

HIGHWAY AND ROUTE No.
OTHER ROADS
TRAILS
SURVEYED LINES
TOWNSHIPS, BASE LINES, ETC.
LOTS, MINING CLAIMS, PARCELS, ETC.
UNSURVEYED LINES
LINES
PARCEL BOUNDARY
MINING CLAIMS, ETC.
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
SURFACE RIGHTS ONLY	
MINING RIGHTS ONLY	
LEASE, SURFACE & MINING RIGHTS	■
SURFACE RIGHTS ONLY	
MINING RIGHTS ONLY	
LICENCE OF OCCUPATION	▼
ORDER IN COUNCIL	
RESERVATION	
CANCELLED	
SAND & GRAVEL	

NOTE [illegible]

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000

METRES 0 200 1000 (1 KM) 2000 (2 KM)

TOWNSHIP

MONTROSE

M.N.R. ADMINISTRATIVE DISTRICT

KIRKLAND LAKE

MINING DIVISION

LARDER LAKE

LAND TITLES / REGISTRY DIVISION

TIMISKAMING

MINISTRY OF NORTHERN DEVELOPMENT AND MINES

DATE	PLAN NO.
	M-237

ARCHIVED MARCH 24/97 APRIL 15/97
CIRCULATED JAN. 30, 1995

210

41P15NW0016 2.17615 BANNOCKBURN

N

Road

Lake

Bannockburn

Charlewood

Zurbigg

1218721
11 Units

1218727
7 Units

1218722
6 Units

1218736

1218732

1218737

1207453

1198912

TL 7500 E
TL 7000 E
TL 6500 E
TL 6000 E
TL 8000 E
TL 8200 E
TL 7200 E
TL 7000 E

L 13200 N
L 13100 N
L 13000 N
L 12900 N
L 12800 N
L 12700 N
L 12600 N
L 12500 N
L 12400 N
L 12300 N
L 12200 N
L 12100 N
L 12000 N
L 11900 N
L 11800 N
L 11700 N
L 11600 N
L 11500 N
L 11400 N
L 11300 N
L 11200 N
L 11100 N
L 11000 N
L 10900 N
L 10800 N

LEGEND
Instrument: SCINTREX ENVI MAG & BRGM OMNI-1V
Parameters Measured: Earth's total magnetic field
Accuracy: +/- 0.1 nano-teslas
Diurnals: Corrected by base station recorder
Contour Interval: 0,50,100,150,200,250,300,.....
Reference Field: 57,400 gammas
Datum Subtracted: 57,500 gammas

SCALE (m) 0 50 100 150 200

2.17615

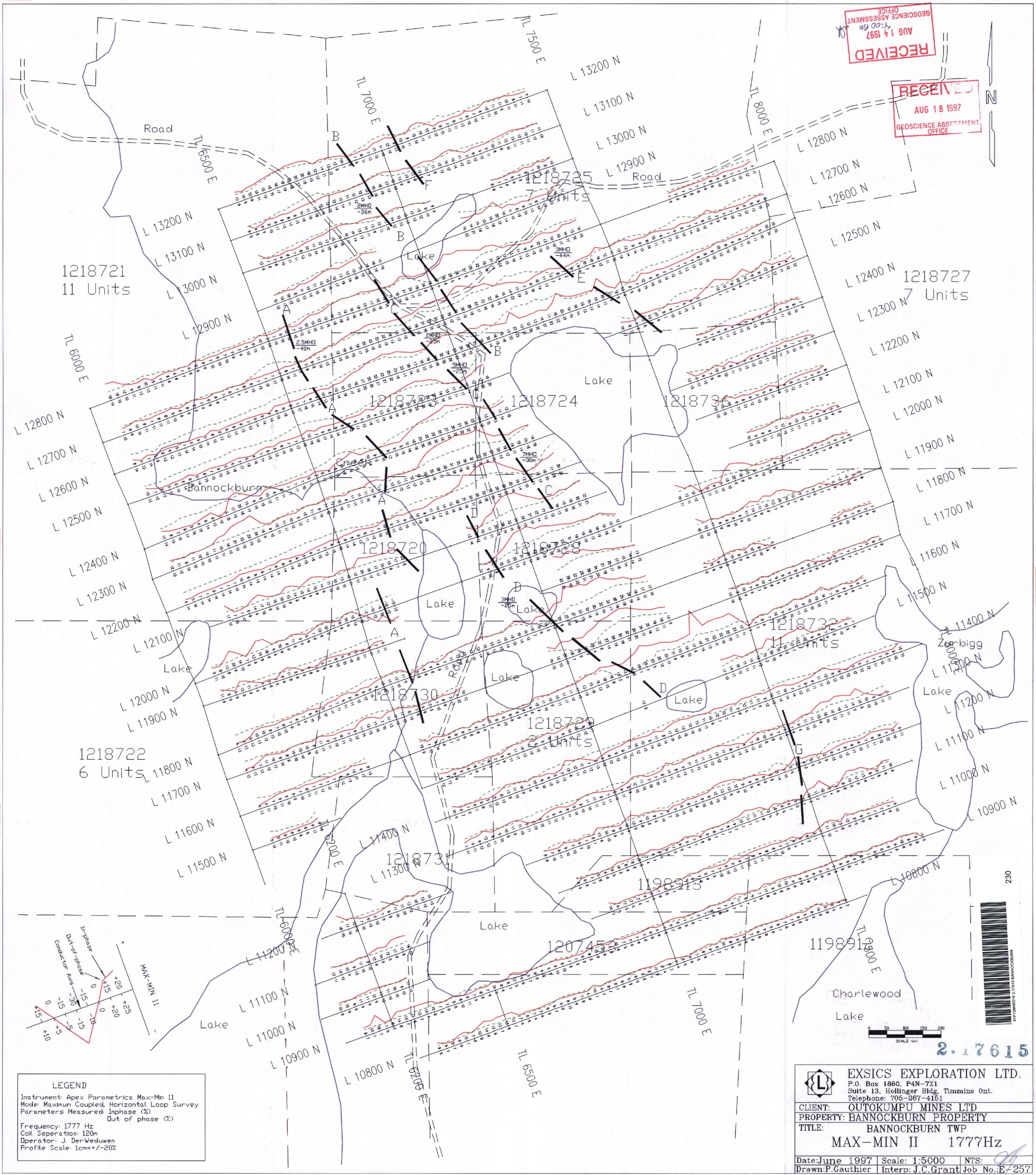
220

41PTSNW0018 2.17615 BANNOCKBURN

EXSICS EXPLORATION LTD.
P.O. Box 1880, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151

CLIENT: OUTOKUMPU MINES LTD
PROPERTY: BANNOCKBURN PROPERTY
TITLE: BANNOCKBURN TWP
MAGNETOMETER SURVEY

Date: June 1997	Scale: 1:5000	NTS:
Drawn: P.Gauthier	Interp: J.C.Grant	Job No.: E-257



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AUG 18 1997
GEOSCIENCE ASSESSMENT OFFICE

LEGEND

Instrument: Apex Parametrics Max-Min 11
Mode: Maximum Coupled, Horizontal Loop Survey
Parameters Measured: Inphase (%)
Out of phase (%)
Frequency: 1777 Hz
Coil Seperation: 120m
Operator: J. DerWeduwen
Profile Scale: 1cm=+/-20%

230

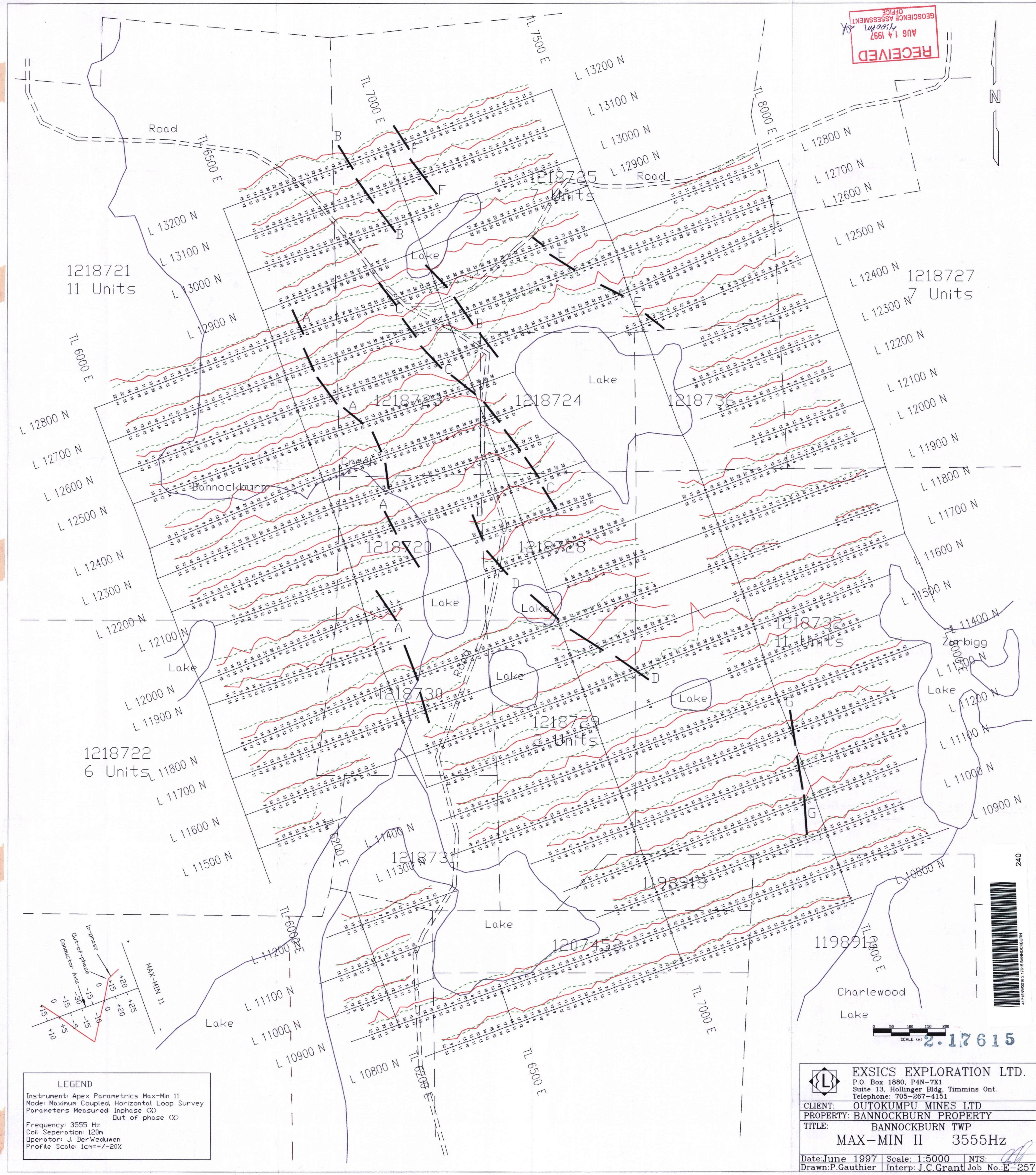
41P15NW0016 2.17615 BANNOCKBURN

2.17615

EXSICS EXPLORATION LTD.
P.O. Box 1880, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151

CLIENT: OUTOKUMPU MINES LTD
PROPERTY: BANNOCKBURN PROPERTY
TITLE: BANNOCKBURN TWP
MAX-MIN II 1777Hz

Date: June 1997 | Scale: 1:5000 | NTS: [illegible]
Drawn: P.Gauthier | Interp: J.C.Grant | Job No.: E-257



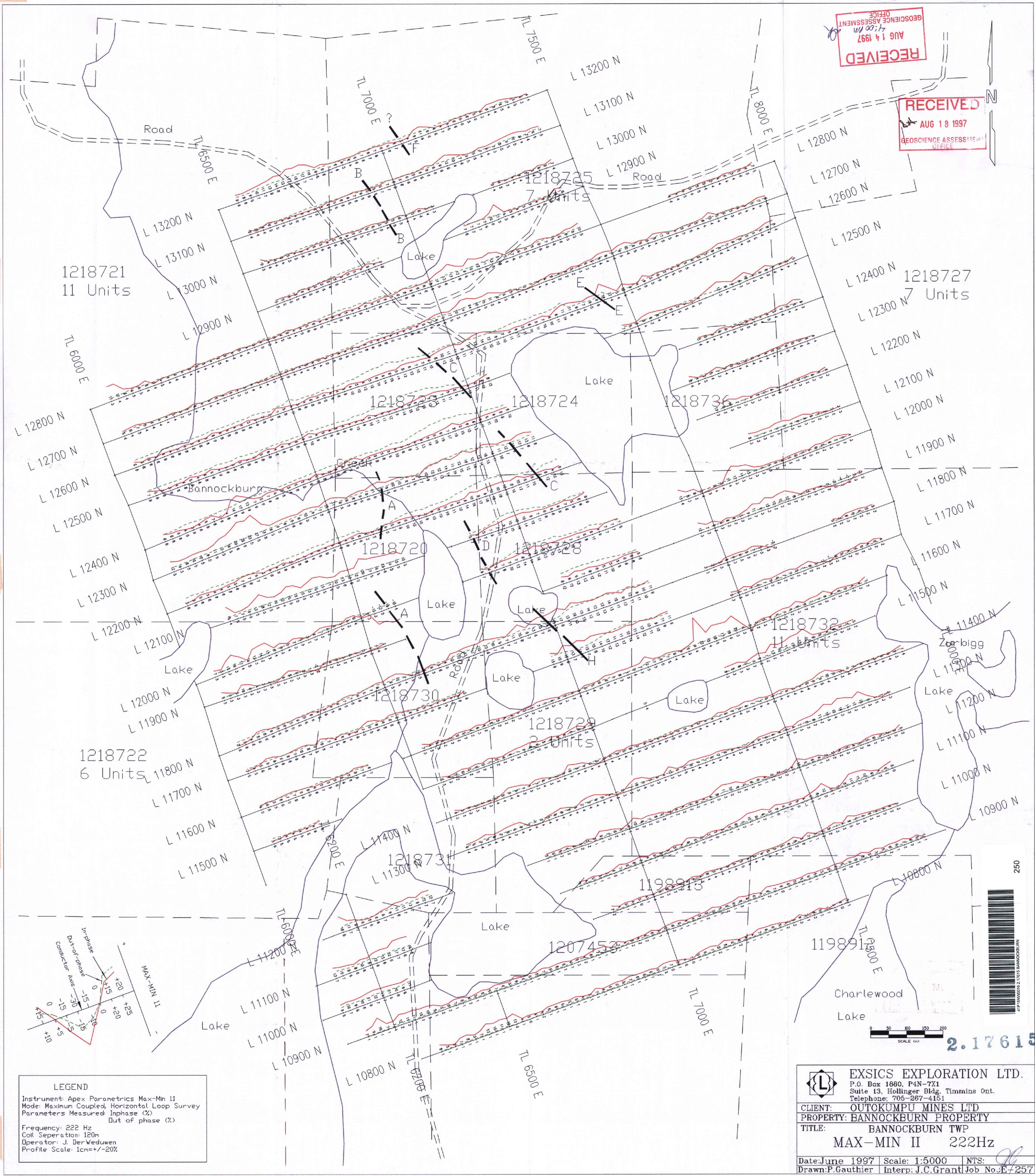
LEGEND

Instrument: Apex Parametrics Max-Min 11
Mode: Maximum Coupled, Horizontal Loop Survey
Parameters Measured: Inphase (%)
Out of phase (%)
Frequency: 3555 Hz
Coil Seperation: 120m
Operator: J. DerWeduwen
Profile Scale: 1cm=+/-20%

EXSICS EXPLORATION LTD.
P.O. Box 1880, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151

CLIENT: OUTOKUMPU MINES LTD
PROPERTY: BANNOCKBURN PROPERTY
TITLE: BANNOCKBURN TWP
MAX-MIN II 3555Hz

Date: June 1997	Scale: 1:5000	NTS:
Drawn: P.Gauthier	Interp: J.C.Grant	Job No.: E-257



LEGEND

Instrument: Apex Parametrics Max-Min 11
Mode: Maximum Coupled, Horizontal Loop Survey
Parameters Measured: Inphase (%)
Out of phase (%)
Frequency: 222 Hz
Coil Seperation: 120m
Operator: J. DerWeduwen
Profile Scale: 1cm=+/-20%

EXSICS EXPLORATION LTD.
P.O. Box 1880, P4N-7X1
Suite 13, Hollinger Bldg, Timmins Ont.
Telephone: 705-267-4151

CLIENT:	OUTOKUMPU MINES LTD
PROPERTY:	BANNOCKBURN PROPERTY
TITLE:	BANNOCKBURN TWP MAX-MIN II 222Hz

Date: June 1997	Scale: 1:5000	NTS:
Drawn: P.Gauthier	Interp: J.C.Grant	Job No. E-257